

A modern office interior featuring a large, lush vertical garden wall. In the foreground, two white leather lounge chairs with wooden frames sit on a grey rug. To the left, a potted plant sits on the wooden floor. In the background, a long wooden desk with several black office chairs is visible. The ceiling has exposed ductwork and track lighting. The overall atmosphere is bright and sustainable.

# FITTING OUT SPACES FOR NET ZERO

Best Practices and Examples  
to Engage Tenants in Sustainability

**ULI** Urban Land  
Institute



## ABOUT ULI

The Urban Land Institute is a global, member-driven organization comprising more than 48,000 real estate and urban development professionals dedicated to advancing the Institute's mission of shaping the future of the built environment for transformative impact in communities worldwide.

ULI's interdisciplinary membership represents all aspects of the industry, including developers, property owners, investors, architects, urban planners, public officials, real estate brokers, appraisers, attorneys, engineers, financiers, and academics. Established in 1936, the Institute has a presence in the Americas, Europe, and Asia Pacific regions, with members in 84 countries. More information is available at [uli.org](https://uli.org).

## ABOUT ULI'S DECARBONIZATION PROGRAM

ULI's Decarbonization Program is focused on climate mitigation and makes the business case for green buildings by tying carbon reductions to increased asset value. The program includes three workstreams to advance decarbonization in the global real estate industry: The ULI Greenprint Community, Decarbonization Thought Leadership, and Decarbonization City Engagement. The Decarbonization Program is organized within ULI's Randall Lewis Center for Sustainability in Real Estate, which also covers Urban Resilience and Healthy Places.

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## INTRODUCTION

To achieve net zero carbon targets as an industry, real estate needs to take a whole-building, whole-life cycle approach to asset-level decarbonization. A vast majority of the definitions of a net zero carbon building now consider both the embodied carbon associated with construction, as well as the operational carbon resulting from the energy use during a building's life. Some definitions even include end-of-life carbon emissions. However, the fit-out phase tends to attract less attention than the construction and operation of buildings, despite the fact that it has a significant impact on the operational performance of the occupied space. In addition, in nondomestic buildings, the interiors can be replaced every three to 10 years, making fit-outs an important part of a building's life cycle.

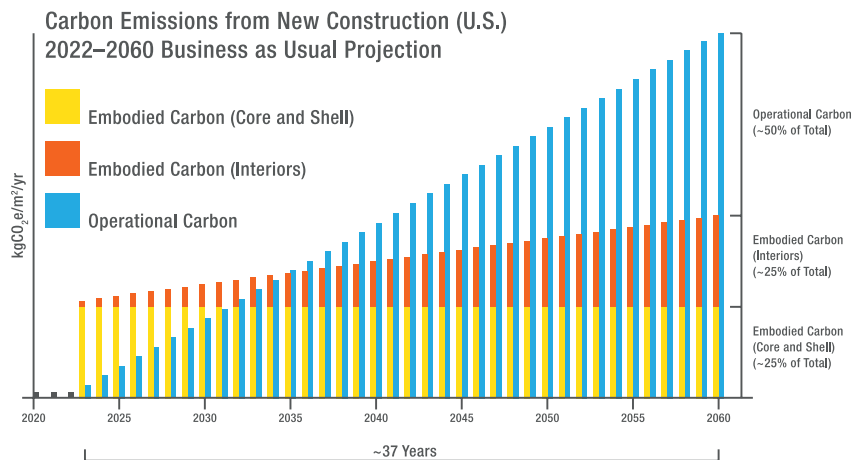
**“We can’t achieve net zero without collaborating with the occupiers of our buildings—and they also want to know how we can help them reduce emissions as a landlord. Fit-out is a great opportunity for both parties to come together and make the right decisions from the outset—but first, it was important to us to showcase best practice on ourselves.”**

– Enoch Lim, Director | ESG, China, Brookfield

## WHY FIT-OUTS FOR NET ZERO?

There is an increasing awareness of the importance of fit-outs in achieving wider net zero carbon goals. Firstly, fitting out a space can either enable or compromise its operational carbon performance, depending on such factors as the energy efficiency of the lighting fixtures or the plug loads associated with the equipment. Fit-outs also have a significant impact on whole-life embodied carbon emissions, especially with the lease cycles shortening (for instance, [one study](#) showed the median office lease term decreasing from five to three years since the start of the COVID-19 pandemic) and the fit-out frequency increasing in commercial real estate. It is estimated that in the context of a building's whole life, the [embodied carbon associated with interiors](#) can be as high as—or higher than—the upfront embodied carbon associated with shell and core, and can add up to 25–60 percent of a building's [whole-life carbon emissions](#).

### Embodied vs. Operational



Source: RESET, [“Revisiting the Iconic Architecture 2030 Chart”](#)

A fit-out is also an excellent intervention point to upgrade the performance of an existing building, providing an opportunity for more thoughtful, carbon-conscious design and procurement, playing an important role in compliance with the emerging net zero carbon building standards—many of which determine operational energy efficiency thresholds. The decisions made at this stage also have a significant impact on large quantities of materials required for a functional space, and they influence the way in which the space is used through the occupancy period. This is particularly significant given that one of the biggest challenges currently facing the built environment sector is bringing up existing stock to net zero carbon standards. Eighty percent of all buildings that will be occupied in 2050 already stand today—the industry’s decarbonization cannot happen without retrofit and refurbishment projects, with the need to renovate [2–5 percent of existing stock](#) every year to reach the Paris Agreement. The renovation rate in Europe currently oscillates around 1–1.5 percent a year, so retrofit efforts will have to significantly increase in coming years, with fit-outs coming more into focus.

In addition, with as much as 70 percent of a building’s carbon footprint being attributed to [occupiers’ activities](#), emissions associated with fit-outs are also likely to soon be recognized in whole-building, whole-life reporting requirements. For example, the rules on climate-related disclosures set by the [International Sustainability Standards Board](#) (which now is responsible for the implementation of the recommendations of the [Task Force on Climate-related Financial Disclosures](#)), proposed [U.S. Securities and Exchange Commission](#), and the [Chinese Sustainability Disclosure Standards for Business](#), require material Scope 1, 2, and 3 reporting, meaning that building owners are expected to support the decarbonization of tenant spaces. The upcoming [Net Zero Carbon Building Standard in the UK](#) is also considering developing performance targets for fit-outs of office, retail, and hotel buildings, due to their high cumulative embodied carbon impact, in addition to upfront embodied carbon and operational



targets. Similarly, the updated [Whole Life Carbon Assessment Standard](#), issued by RICS, recommends including the emissions associated with fit-outs when evaluating a building's whole-life carbon impacts.

This growing drive for taking a whole-building, whole-life perspective on carbon emissions—both operational and embodied—is helping owners and occupiers realize the influence that each other's activities have on their ability to achieve their net zero carbon goals, encouraging more engagement between both parties at all stages of a building's life cycle, including fit-outs.

A fit-out project can take anywhere from a few weeks to a few months, which may not seem like a long time when compared with the duration of construction or a building's expected life.

However, as this stage requires significant material inputs and occupancy-related decisions, it is a unique opportunity to improve a building's carbon performance. Building on [ULI's Tenant Optimization Program](#), which outlines 10 steps to achieving deep energy and financial savings in leased spaces, there are several strategies that help ensure that fit-out activities support wider decarbonization efforts. In addition, conducting a project's life cycle assessment can highlight further areas with the highest potential for carbon savings, supporting organizations to prioritize the most impactful strategies. It is important to note that for these strategies to be successful and yield the expected results, owners, occupiers, and the wider value chain involved in the project should be engaged from the very beginning and throughout the process.



**“Changing the mindset was the key enabler of our low-carbon fit-out’s success. Creating a story around reuse inspired people to proactively seek other opportunities for reducing carbon and waste.”**

— Cathleen Dempsey, Senior Construction Manager, Hines



# THE BENEFITS OF NET ZERO FIT-OUTS

## POTENTIAL

### BENEFITS TO TENANTS

- Meeting corporate targets: ensuring the office performs at the level required for net zero
- Cost savings through achieving efficiencies and reducing demand for new materials
- Cost savings through energy efficiency measures for reduced utility expenses
- Shorter lead times if reusing existing fit-out components
- Design for disassembly for agility and easy adaptation of the space to changing occupancy needs
- Healthier space, which increases the occupants' comfort and productivity

## POTENTIAL

### BENEFITS TO OWNERS

- Meeting corporate targets: ensuring the office performs at the level required for net zero
- Future-proofing the office to attract tenants and achieve lower vacancy rates
- Deeper engagement resulting in better relationships with tenants
- Best practice reporting and accounting for whole-building, whole-life emissions—both through capturing data on fit-out emissions and through installing sub-meters
- Demonstrating leadership through green building interior certifications or other innovations
- Complying with local climate policies around building performance, such as minimum efficiency standards, and anticipating future regulatory changes



# STRATEGIES FOR FIT-OUTS THAT SUPPORT WHOLE-BUILDING DECARBONIZATION

## STRATEGY:

**Embed the net zero carbon requirements into all processes, policies, and agreements.** To support the net zero carbon credentials of a space, it is equally important for both owners and occupiers to ensure that all performance targets and resulting requirements are communicated to all parties involved early on in the process. From a tenant's perspective, it starts with a clear project brief that informs the decisions made at the site selection, contractor selection, design, procurement, and construction stages of a fit-out. A net zero carbon project brief can establish from the outset what data needs to be collected by whom to monitor compliance with embodied and operational carbon targets, which helps to avoid the challenges of collecting the data from third parties after project completion. For landlords, it is essential to make sure that the fit-out does not compromise the whole building's net zero carbon performance, either through [embedding relevant clauses in lease agreements](#), or by providing tenants with fit-out guides before the start of a project. It is also crucial for a landlord to stay engaged throughout the fit-out process to make sure the clauses and the guidance are adhered to.

## EXAMPLE:

**IHG Hotels & Resorts.** As the majority of the hotels operated by IHG Hotels & Resorts are owned by third parties, IHG needs to work very closely with the hotel owners to ensure progress against its 1.5°C-aligned Science Based Target. The company's initial focus has been mostly on operational carbon reductions,

## RESOURCES

### FOR LOW-CARBON FIT-OUTS

- [ULI Tenant Energy Optimization Program](#)
- [RESET: Circularity and Carbon](#)
- [BBP: Responsible Fit-out Toolkit](#)
- [Grosvenor: Tenant Fit-out Guides](#)
- [Hudson Pacific Properties: Embodied Carbon Fitout Guide](#)
- [Building Council of Australia: "Circular Fitout Toolkit for Offices"](#)
- [Singapore Building and Construction Authority: Green Lease Toolkit](#)
- [JLL Hong Kong: "How Workplace Fit Outs Can Tackle Their Hidden Carbon Footprint"](#)
- [Arup EU: "Circular Fit Out in Retail Stores"](#)

## CERTIFICATIONS

### FOR LOW-CARBON FIT-OUTS

- [Energy Star Tenant Space Recognition](#)
- [SKA Rating for Commercial Fit-outs](#)
- [International Living Future Institute: \*Living Building Challenge – Interiors\*](#)
- [LEED v4: Reference Guide for Interior Design and Construction](#)
- [BREEAM Refurbishment and Fit-out](#)

and to achieve those, IHG needed to ensure that all hotel fit-outs considered operational energy conservation measures. The team initially analyzed 16 hotels across different brands, regions, and climate zones to understand which energy conservation measures would yield the best results, and engaged with the IHG Owners Association to share the findings. This led to incorporating numerous measures, such as LED lighting, guest room occupancy sensing thermostats, public area programmable thermostats, lighting controls or package terminal heat pumps, into IHG's brand standards that guide the decision-making during a hotel fit-out, including both common areas and hotel rooms.

### EXAMPLE:

**Grosvenor.** Grosvenor's UK property business is committed to becoming climate positive before 2050 and achieving Science

Based Targets of reducing carbon emissions by at least 52 percent by 2030 and 90 percent by 2040. The company understands that landlord-tenant collaboration and retrofitting existing buildings are crucial enablers for achieving these commitments. Recognizing the significance of fit-outs in both areas, Grosvenor published a guide that outlines how occupiers should approach their fit-outs to minimize the building's future energy demand and material use. The guide provides a set of practical recommendations on cutting operational carbon through, for example, LED lighting, motion sensors, blinds to reduce overheating, draft proofing, and smart metering. It also offers advice on reducing embodied carbon by considering flexible layouts, choosing reclaimed or bio-based materials, or prioritizing reused products. The guide clearly sets out what good and best practices look like and encourages tenants to measure and report on the impact of their fit-out projects through a whole-life carbon assessment.



Fully electric Holiday Inn Express Hamburg South, owned by IHG Hotels & Resorts (IHG Hotels & Resorts)





## STRATEGY:

**Design carbon out.** Decisions made at the design stage can significantly impact both the space's embodied and operational carbon performance. In terms of operational carbon, minimizing energy use during occupancy is key—for example, ensuring that the design maximizes the use of natural daylight and heat gain, and specifying low-carbon measures in the design, including efficient lighting, occupancy sensors, daylight dimming controls, automated window blinds, and plug load control. To ensure that the space performs at the required levels consistently, planning for regular monitoring and fitting in submeters is also essential. On the embodied carbon front, this includes designing out unnecessary materials: choose standardized elements over bespoke items, as they create less waste during production and have higher reuse rates—e.g., single-colored

carpet tiles, partition walls, or cabinetry. It also includes focusing on adaptability of the space, using modular and flexible design solutions that can serve different purposes, according to the occupier needs changing over the course of a day, month, or whole tenancy period.

## EXAMPLE:

**Arup.** Arup has committed to achieving net zero carbon emissions across its global operations by 2030, and moving into a new net zero-certified space in London was an opportunity to create an interior aligned with the company's ambitions. With net zero carbon being a high priority for both Arup and the building's developer and owner, Derwent London, close collaboration on this issue came naturally to both parties. For example, Arup and Derwent London worked together to ensure that the base condition of the space suited Arup's requirements, minimizing potential waste.

Considerations to minimize operational carbon were incorporated into the fit-out's design from the outset—for example, the specification included smart technology such as occupancy sensors, environment controls, feedback buttons for occupants to report issues in real time, and QR codes to track plug loads. This has helped to continuously capture data, monitor actual performance, and improve the operational efficiency of the space.

To reduce the upfront embodied carbon of the fit-out, Arup specified exposed ceilings and services, eliminating the need for ceiling tiles, and wireless Bluetooth lighting system in the coworking part of the building, saving hundreds of meters of cables. To minimize the embodied carbon throughout the life cycle of the interior, the office's design focused on long-term adaptability, ensuring that three quarters of the fit-out could be disassembled and moved. Some areas of the space were also

designed to serve multiple purposes to maximize their use. For instance, the reconfigurable auditorium has a dual function of an events and a coworking space.

## STRATEGY:

### **Maximize the retention and reuse of existing materials.**

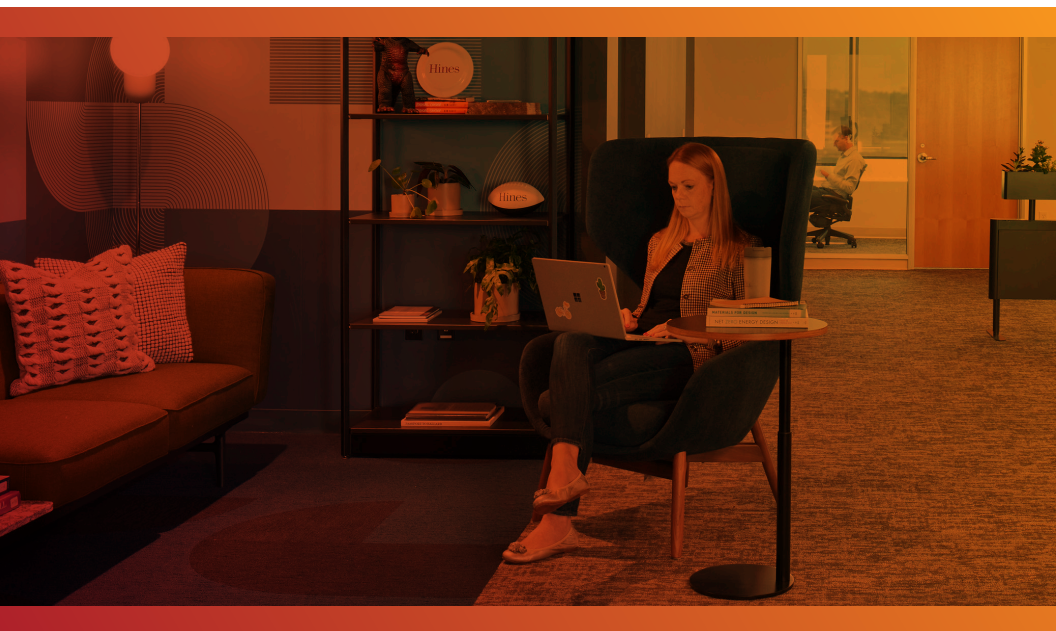
Minimizing demand for new items and extending the life of existing elements is one of the most effective ways of reducing embodied carbon associated with a fit-out project. Occupiers can prioritize retaining the elements of their previous space, such as furniture, partitioning, or AV equipment. It is important, however, to consider how this will impact the operational carbon performance—for example, older AV equipment might be less energy efficient. Owners can play a role facilitating reuse of items and materials between outgoing and incoming tenants. This can be achieved by enabling discussions between outgoing



Arup's net zero-certified space in London (Arup)



The interior of Hines's Seattle headquarters (Hines)



and incoming tenants, and by updating reinstatement clauses in lease agreements when applicable to allow certain fit-out elements to be retained and reused in the space.

### EXAMPLE:

**Hines.** For Hines, the announcement of the company's pledge to achieve net zero carbon operational emissions by 2040 coincided with moving its Pacific Northwest headquarters to the Norton Building in Seattle. The team saw this as an opportunity to ensure that the fit-out of the office supports the decarbonization goal. Hines partnered with LMN Architects who, by tracking the carbon impact of every existing versus potentially new material, identified multiple ways of lowering the embodied carbon footprint of the project. This approach encouraged retaining the materials that were already in the space, such as the carpet that was only two years old at the time of the fit-out, and the conference room

glazing that was repurposed for the entrance. Other elements of the fit-out reused other organizations' waste—for instance, carpet used for the elevators was originally marked as overstock by a flooring distributor. The project reused significant quantities of wood: the reception desk and the feature wall representing the topography of Seattle were created out of wood offcuts, while some doors and tables were made out of discarded timber. As a result, the embodied carbon associated with the project was 65 percent lower than a typical fit-out.

## STRATEGY:

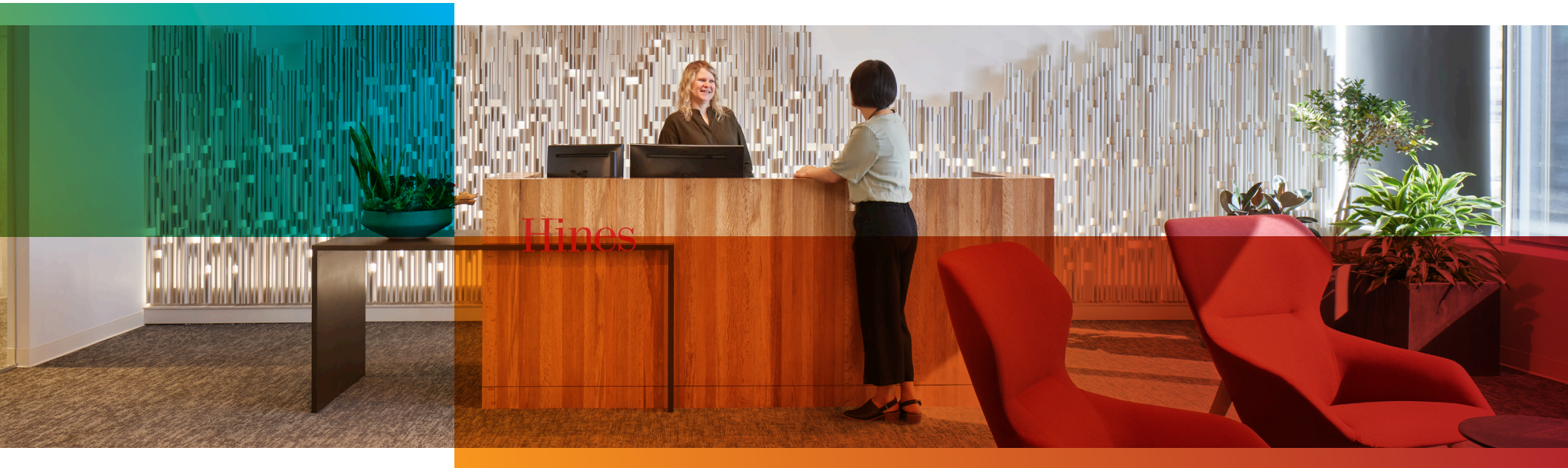
**For new elements, choose low-carbon materials.** Where retaining existing elements is not possible, focus on solutions with low embodied carbon, for example with high recycled content or made with natural, carbon-sequestering materials, such as timber, wool, hemp, or other plant fibers. Choosing local products and materials also helps reduce embodied carbon associated with a fit-out project. To find out the carbon footprint of different products and materials, ask your suppliers for [Environmental Product Declarations](#) or third-party certifications such as [Cradle to Cradle](#).

## EXAMPLE:

**Brookfield.** Brookfield intends to achieve net zero carbon emissions for operations across all their assets by 2050, or earlier.

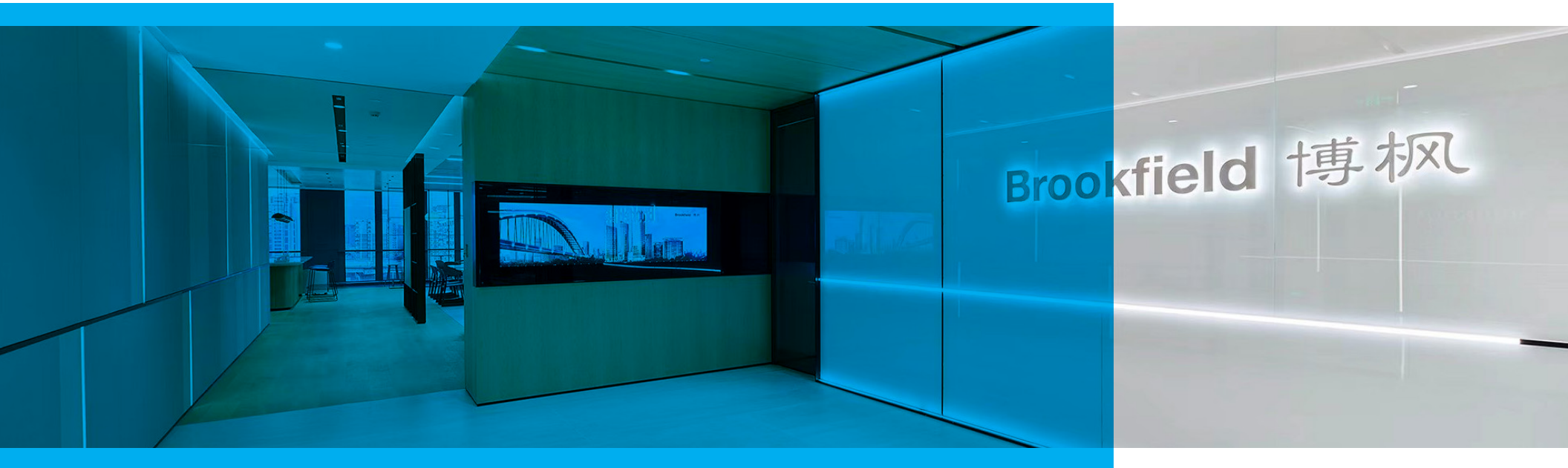
A detailed materiality review showed that reaching this goal would not be possible without strong collaboration with Brookfield's tenants, who are also increasingly interested in how landlords can support their net zero carbon ambitions. Brookfield wanted to showcase the possibilities through its new Shanghai office fit-out, while also making progress toward the company's own carbon- and health-related aims.

The project achieved a 41 percent embodied carbon reduction compared to a standard fit-out, largely due to Brookfield quantifying the carbon associated with different products and solutions, which was crucial in procurement decision-making. All materials were assessed against the RESET Standard, with the criteria taking into account the embodied carbon, circularity, and health impacts. This analysis allowed Brookfield to choose carbon neutral Milliken carpets and other low-carbon materials, such as plasterboard from Saint-Gobain, ceramic tiles from



The interior of Hines's Seattle headquarters (Hines)





Porcelanosa, or chairs from Vitra, all of which had high recycled content and were recyclable. As a result, the interior was awarded a RESET Carbon Neutral Certification for Embodied Carbon, as well as a RESET Net Zero Certification for Operations Carbon for Commercial Interiors.

## STRATEGY:

**Keep an inventory and have a plan for the end-of-life of each fit-out element.** A fit-out's lifespan is usually just a few years, and some elements will have to be replaced after an even shorter time. Minimizing waste and reducing demand for new materials leads to a lower embodied carbon footprint not only for a fit-out project, but also for an organization as a whole. Keeping an inventory of all the elements of the space, or treating the fit-out as a "[material bank](#)," facilitates creating a plan for each item's end-of-life according to a prescribed hierarchy, prioritizing

retaining the item in use within an organization, or deploying it for reuse elsewhere. Such an inventory also encourages planning for disassembly and reuse upfront, focusing on modularity, assembling items with nuts and bolts rather than glue, or movable items (such as portable meeting booths).

## EXAMPLE:

**JLL.** With a Science Based Target to achieve net zero carbon by 2040, one of JLL's areas of focus has been decarbonizing the spaces it occupies. Recognizing the role fit-outs play in delivering this strategy, when moving into 20 Water Street in London, JLL set out to minimize the whole-life carbon associated with the project, ultimately achieving a 42 percent reduction in upfront embodied carbon against a typical baseline. Given the short five-year lease, it was particularly important to consider each element's lifespan and develop a plan for its end of life, not only to reduce the embodied carbon footprint of the

fit-out project, but also of the wider portfolio—as many of the interior components could be reused across JLL's estate, considerably reducing demand for new materials. The team developed an “end of life management hierarchy” document in which different options were evaluated for each product. The options included reuse on site by future tenants, reuse within JLL's portfolio, reuse in the secondary market, manufacturer take-back schemes, and recycling. The aim of this formalized approach was to assess the feasibility and the carbon impacts of each end-of-life management option, encouraging the team to prioritize the lowest-carbon solutions, such as reuse, where possible. This strategy also informed some of the decision-making upfront: to enable reclaiming the components effectively, many of the office fittings were modular, demountable, standardized, and installed using fixings that support disassembly. This also allowed the team to easily respond to user feedback to reconfigure the space shortly after JLL moved in, without any significant carbon impact.

## STRATEGY:

**Use the low-carbon fit-out to educate and inspire the real estate industry.** As people interact directly with the components of a fit-out, often on a daily basis, its impact can reach far beyond the four walls of a space. Building interiors can serve as tangible examples of low-carbon solutions that educate the users and, as a result, encourage positive behaviors in the real estate industry. Through low-carbon fit-outs, owners and occupiers can demonstrate what is possible and inspire other organizations—and individuals—to take action via community partnerships, building certifications focused on tenant fit-outs, and promotion of their low carbon fit-out while showing leadership at the same time.



JLL's 20 Water Street office space (JLL)







## EXAMPLE:

**TPG Architecture LLP.** In 2013, TPG Architecture, an architectural firm headquartered in New York City, signed a lease for 40,000 square feet on floors 4 and 5 at 31 Penn Plaza, a 440,000-square-foot, 18-story office building located between Sixth and Seventh avenues in Midtown Manhattan. The overarching goal of the buildout was to create an office space that demonstrates energy efficiency's strong return on investment, which would serve as a model for design clients. To help achieve that goal, TPG decided to follow the Tenant Energy Optimization process—a proven, replicable approach that integrates energy efficiency into tenant space design and

construction and delivers excellent financial returns through energy conservation.

"It helps to tell our story," said TPG associate Samantha McCormack. "You may not realize that these fixtures are there, and clients are interested in how to implement these sustainable technologies." When TPG gives office space tours, it highlights the energy conservation measures and sustainable measures it has implemented to guests and potential clients. For instance, signs note the use of Energy Star-rated equipment and explain the installed daylight-harvesting system and occupancy sensors.

*"The process doesn't finish at the end of the fit-out. If something isn't working, a circular, agile fit-out makes it easier to respond to change, without additional embodied carbon implications."*

– Stuart Cochrane, Workplace Sustainability Lead, JLL UK



## LOOKING AHEAD

Both real estate owners and tenants have started to recognize that fit-outs can have considerable implications for operational and embodied carbon performance of a building—and are an essential step to achieving net zero buildings. What is more, while many landlords still consider interior finishes to be fully the occupier's responsibility, this narrative is changing too and both parties are realizing the advantages of working together on fit-out projects.

This collaborative approach will be crucial to achieving net zero carbon throughout a building's life cycle, especially as the focus increasingly shifts towards decarbonizing the existing stock. And the benefits do not end there—a low-carbon space tends to also be flexible, efficient, and adaptable to evolving occupant's needs, which makes it all the better prepared for the future.





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